

4. The probe of claim 3, wherein the rib is disposed perpendicular to the impact surface.

A2 5. (amended) The probe of claim 2, wherein the low pressure plenum is shaped to include a longitudinally extending rib portion coupled to the first plenum.

6. The probe of claim 5, wherein the at least one non-impact aperture is disposed in the rib portion.

7. The probe of claim 2, wherein the non-impact surface is substantially flat.

8. The probe of claim 7, wherein the non-impact surface is substantially parallel to the impact surface.

A3 9. (amended) The probe of claim 2, wherein the low pressure plenum is shaped to include a pair of longitudinally extending rib portions diverging angularly with respect to the impact surface.

10. The probe of claim 9, wherein the non-impact surface is disposed on a portion of one of the laterally extending rib portions that faces the other of the laterally extending rib portions.

A4 11. (amended) The probe of claim 2, wherein the low pressure plenum is shaped to include a pair of spaced apart longitudinally extending rib portions each disposed perpendicular to the impact surface.

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12. (amended) The probe of claim 1, wherein the high pressure plenum has a plenum width and the impact surface is shaped to create a localized region of relatively high pressure across substantially the entire plenum width.

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13. The probe of claim 12 wherein the plenum width ranges from about 1.27 centimeters to about 5.08 centimeters.

14. The probe of claim 1, wherein the at least one impact aperture has an aperture width ranging from about 0.0762 centimeters to about 0.635 centimeters.

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15. (amended) The probe of claim 1, wherein the high pressure plenum has a plenum width, the at least one impact aperture has an aperture width, and wherein the ratio of plenum width to aperture width is greater than about 8:1.

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16. CANCEL

17. A method of measuring differential pressure in a fluid-carrying conduit comprising:

generating an upstream pressure with a longitudinally extending substantially flat impact surface;

communicating the upstream pressure from an impact aperture<sup>48</sup> disposed on the impact surface to a first pressure sensor port;

generating a non-impact pressure;

communicating the non-impact pressure from a non-impact aperture to a second pressure sensor port, the non-impact aperture being spaced from the impact aperture.

18. (amended) A differential pressure measurement system coupleable to a process control loop and adapted to communicate a process variable output related to a differential pressure of a fluid flow within a fluid-carrying conduit, the system comprising:

a process pressure transmitter including:

a loop communicator coupleable to the process control loop and adapted for communication upon the process control loop;

at least one pressure sensor having first and second pressure inlets;

measurement circuitry coupled to the at least one pressure sensor and configured to provide a sensor output related to differential pressure between the first and second pressure inlets;

a controller coupled to the measurement circuitry and the loop communicator, the controller adapted to provide a process variable output to the loop communicator, the process variable output related to the sensor output; and

a differential pressure measurement probe adapted for placement within the fluid-carrying conduit, the probe including:

a first plenum<sup>2</sup> coupled to the first pressure inlet<sup>38</sup>, the first plenum including a longitudinally extending impact surface with at least one impact aperture<sup>46</sup> disposed to communicate pressure from the impact surface<sup>46</sup> to the first pressure inlet<sup>38</sup>;

a non-impact surface spaced from the impact surface, the non-impact surface having a non-impact aperture<sup>52</sup> disposed to



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communicate pressure from the non-impact surface to the second pressure inlet.<sup>40</sup>

19. CANCEL

20. (new) A differential pressure measuring probe adapted for transverse placement within a fluid-carrying conduit, comprising,

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a body<sup>16</sup> having an upstream facing impact surface and where the upstream facing impact surface<sup>uv</sup> is substantially flat and adapted to be disposed perpendicularly to the direction of fluid flow in the conduit,

at least one fluid pressure transmitting plenum within the body, and

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at least one opening in the flat upstream facing impact surface of the body, establishing fluid communication between the fluid in the conduit and the at least one fluid pressure transmitting plenum, whereby the flat upstream facing impact surface of the probe body creates a relatively quiescent area upstream of the probe.

21. (new) The probe of claim 20 and further comprising, at least one downstream non-impact surface,

at least one non-impact fluid pressure transmitting plenum within the body, and

at least one opening in the at least one non-impact surface of the body establishing fluid communication between the fluid in the conduit and the at least one non-impact fluid pressure transmitting plenum.

22. (new) The probe of claim 21 where the body includes a longitudinally extending and downstream extending hollow rib portion having at least one of the non-impact surfaces and containing therein the at least one fluid pressure transmitting hollow section.

23. (new) The probe of claim 21 where the downstream non-impact surface is substantially flat and parallel to the flat upstream facing impact surface.

24. (new) The probe of claim 21 where the downstream non-impact surface is substantially flat and parallel to the flat upstream facing impact surface and where the at least one opening in the downstream surface is in the said substantially flat non-impact surface.

25. (new) The probe of claim 21 where the body includes,

a pair of spaced apart downstream extending legs, each having a downstream non-impact surface.

8 26. (new) The probe of claim 25<sup>7</sup> where the legs are hollow and have a plurality of bounding walls and where the at least one fluid pressure transmitting plenum is contained within the walls and where the at least one opening is in at least one wall.

9 27. (new) The probe of claim 20<sup>2</sup> where the at least one opening is a longitudinally extending slot having a length greater than its width.

10 28. (new) A differential pressure measuring probe adapted for placement within a fluid-carrying conduit, comprising,

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a bluff body having a width and a flat upstream facing fluid impact surface coextensive with the width of the body, whereby a localized region of quiescent total fluid pressure is created on the impact surface.

10 29. (new) The probe of claim 28<sup>10</sup>, and further including,  
at least one opening in the said impact surface, and  
a fluid carrying channel in communication with the at least one opening for transmitting the said total fluid pressure exteriorly of the conduit.



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1230. (new) The probe of claim 28 where the flat upstream facing impact surface is adapted to be positioned perpendicularly to the direction of fluid flow in the conduit.

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31. (new) A method of measuring differential pressure in the flowing fluid within a closed conduit as a factor in determining the rate of fluid flow in the conduit, comprising,

creating an upstream zone of relative quiescence stagnation within the flowing fluid proximate the flat upstream facing surface of a bluff body positioned in the flowing fluid perpendicularly to the direction of fluid flow;

detecting the total pressure of the fluid at the flat upstream facing surface of the bluff body, and

communicating the total pressure to a pressure sensor.

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32. (new) The method of claim 31 and further including,

creating a downstream zone of relatively quiescent fluid stagnation downstream of the flat upstream facing surface of the bluff body,

detecting the static pressure of the fluid in the downstream fluid stagnation zone, and

communicating the static pressure to a pressure sensor.